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CLAIMS

1. (Previously presented) A process for polymerizing one or more vinylically-unsaturated monomers to form a polymeric product, comprising:
contacting said vinylically-unsaturated monomers with a chain transfer catalyst and a hydrogen atom donor molecule in the absence of conventional free radical initiators, at a temperature from about room temperature to about 240 °C.
2. (Previously presented) A process for polymerizing one or more vinylically-unsaturated monomers by contacting said vinylically-unsaturated monomers with a chain transfer catalyst and hydrogen gas in the absence of conventional free radical initiators, said process carried out at a temperature from about room temperature to about 240 °C.
3. (Canceled)
4. (Previously presented) The process of Claim 1 or 2, wherein the temperature is from about 50°C to 150°C.
5. (Previously presented) The process of Claim 1 or 2 wherein the chain transfer catalyst is selected from the group consisting of cobalt(II) and cobalt(III) chelates and a mixture thereof.
6. (Previously presented) The process of Claim 1 or 2, wherein said process is a batch process.
7. (Previously presented) The process of Claim 1 or 2, wherein said process is a semi-batch or starved feed process.
8. (Previously presented) The process of Claim 1 or 2, wherein said process is a continuous process.
9. (Previously presented) The process of Claim 1, wherein the hydrogen atom donor is selected from dihydronaphthalene, silicon hydrides, tin hydrides, organometallic hydrides, benzylic alcohols, hydroquinones, alkyl ether hydroquinones, and benzhydrol.

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10. (Previously presented) The process of Claim 9, wherein the hydrogen atom donor is dihydronaphthalene, triethylsilane, tributyltin hydride, hydroquinone, methyl ether hydroquinone, tetraethylcyclotetrasiloxane, methyldimethoxysilane, tetramethyldisiloxane, trimethylsilane, or benzhydrol.

11. (Previously presented) The process of Claim 1 or 2, wherein the process is conducted in the presence of a solvent selected from the group consisting of ketones; alcohols; amides; aromatic hydrocarbons; ethylene glycol; glycol ethers, alkyl esters, mixed ester ethers; and mixtures thereof.

12. (Currently amended) The process of Claim 1 or 2, wherein at least one monomer is a methacrylate monomer ~~selected from the group consisting of Class I monomers.~~

13. (Currently amended) The process of Claim 1 or 2, wherein at least one monomer is an acrylate or a styrene monomer ~~selected from the group consisting of Class II monomers.~~

14. (Currently amended) The process of Claim 1 or 2, wherein at least one monomer is a methacrylate monomer, and at least one monomer is an acrylate monomer or a styrene monomer ~~selected from Class I and Class II.~~

15. (Previously presented) The process of claim 12 or 14 wherein the resulting product is terminally unsaturated.

16. (Previously presented) The process of Claim 1 or 2, wherein the hydrogen pressure is from 0.01 to 100 atmospheres.

17. (Previously presented) The process of Claim 1 or 2, wherein the hydrogen pressure is from 1 to 10 atmospheres.

18-23. (Cancelled).

24. (Previously presented) The process of claim 1 or 2, wherein said process is carried out in the presence of a solvent.

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25. (Previously presented) The process of claim 11, wherein said ketone is selected from acetone, butanone, pentanone and hexanone.
26. (Previously presented) The process of claim 11, wherein said alcohol is isopropanol.
27. (Previously presented) The process of claim 11, wherein said amide is dimethyl formamide.
28. (Previously presented) The process of claim 11, wherein said aromatic hydrocarbon is selected from toluene and xylene.
29. (Previously presented) The process of claim 11, wherein said ether is selected from tetrahydrofuran and diethyl ether.
30. (Previously presented) The process of claim 11, wherein the mixed ester ether is a monoalkyl ether monoalkanoate.
31. (Previously presented) The process of claim 1 or 2, wherein the catalyst is a glyoximato-based cobalt chain transfer catalyst.
32. (Previously presented) The process of claim 1 or 2, wherein the catalyst is selected from hydrogen bridged bisglyoximato ligands.
33. (Previously presented) The process of claim 1 or 2, wherein said process is carried out in the presence of an electron donor.